

In re: Shima, et al.
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Filed: June 28, 2000
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REMARKS

Claims 1 – 6 of the application are pending. The rejections of record are addressed below in the order presented in the Office Action. Reconsideration is respectfully requested in view of the foregoing amendments and following remarks.

By way of background, cellulose ether is a valuable commercial product produced by contacting fibrous powdered pulp and alkali to prepare an alkali cellulose, and subsequently dissolving the alkali cellulose in an aqueous solution. If the alkali does not significantly permeate into the powdered pulp, the resultant alkali cellulose may not dissolve sufficiently in an aqueous solution. The residual insolubles can create processing problems as well as lower yields. Thus, it is important for the original powdered pulp particles to have a large surface area.

Cotton linter pulp and wood pulp have traditionally been ground by means of a grinder such as a knife mill. The resultant powdered pulp material is used in the production of various downstream products. However, grinding pulp using a conventional grinding apparatus, such as a knife mill, can be problematic. For instance, a knife mill relies upon shearing forces, and the resultant powdered pulp has a relatively long fibrous shape which is not easily permeated by the alkali, and which can be detrimental in downstream processing of the cellulose ether.

In the invention, the beginning cotton linter pulp or wood pulp is ground by means of a vertical roller mill, such as illustrated in Figure 1. The inventors have found that the grinding principle of such a roller mill involves compression and grinding forces, as well as shearing forces, which result in a ground pulp with particles of different shape as compared to the elongated fibrous form of the powdered pulp produced using a knife mill. The shape and size of the resulting powder improves permeation of alkali material and otherwise improves the overall production of cellulose ether. See page 4, lines 10-18.

Rejections Under 35 U.S.C. §102

Claims 1-3 stand rejected under 35 U.S.C. §102(b) as anticipated by Tanaka. Claim 1 recites the use of a vertical roll mill to pulverize cotton linter pulp and wood pulp. Claims 2 and 3 depend from Claim 1. Whereas Tanaka does not teach or suggest the pulverization of cotton

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linter pulp or wood pulp by use of a vertical roller mill, the instant claims have been distinguished from the Tanaka reference. Applicants accordingly respectfully request withdrawal of this rejection.

Rejections Under 35 U.S.C. §103

Claims 4-6 stand rejected under 35 U.S.C. §103 in view of Tanaka in combination with Downing. Applicants offer the following comments.

Tanaka nowhere teaches or suggests treating cotton linter pulp or wood pulp as claimed. Thus, Tanaka is not concerned with modifying particle surface area of cotton linter or wood pulp, much less modifying the shape thereof so as to improve penetration by an alkali. Indeed, Tanaka would not be concerned with such issues because the product treated therein has already been processed by alkali.

The Downing patent does not overcome the deficiencies of Tanaka. Downing is directed to a method for converting cellulose into a flake or powder form, "showing little or nothing of the original fibrous structure." Column 1, lines 28-32. Downing further states that the powder or flake thus produced does not require excess amounts of alkali in downstream processing. See Column 3, lines 32-39. Thus, rather than recognizing a problem with the resultant particles, Downing in fact teaches that its process solves issues related to the downstream processing of cellulose fibers.

There is no motivation or suggestion to combine the teachings of the cited references. Tanaka and Downing are directed to the processing of different products, and thus address different issues. Further, Downing states that the resultant particles are non-fibrous, so there is no motivation to modify its process. Thus the references do not teach or suggest, singly or in combination, the use of a vertical roller mill to grind cellulose into a powder prior to the conversion of cellulose to cellulose ether. Accordingly, Applicants respectfully request withdrawal of this rejection as well.

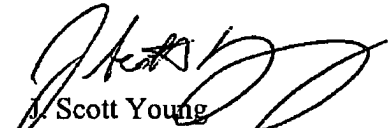
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Conclusion

The rejections set forth in the Office Action having been addressed in full, it is respectfully submitted that this application is in condition for allowance, which action is respectfully requested. The amendments and remarks in this response introduce no new matter and are based solely on the references previously cited. No new search should be necessary.

In view of the amended claims and the arguments presented above, it is respectfully submitted that all of the claims of the application are in condition for allowance. It is not believed that extensions of time or fees for net addition of claims are required, beyond those, which may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefore (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,


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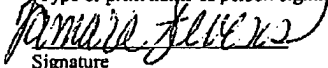
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Version with Markings to Show Changes Made:

1. (Once amended) A method for reducing pulp to powder which comprises grinding pulp by means of a vertical roller mill to produce powdered pulp, wherein the pulp is selected from the group consisting of cotton linter pulp and wood pulp.